3e Site Specific Agriculture based on Farmers' Experience

1. THE CONCEPT

The basic premises we work from are that: (a) as the conditions under which farmers operate are highly heterogeneous and farmers are always trying out something new, every time a farmer plants and harvests a crop it is an experiment, and (b) if it were possible to compile the information on what the farmer did and characterize the conditions of a large number of these experiments it would be possible to deduce optimum practices for specific conditions. This approach is actually as old as agriculture itself with farmers constantly experimenting, observing and innovating: what is new is the power of modern information technology available to us to exploit to the full this approach. It is now feasible to bring together multiple experiences, and through network effects, obtain vastly more valuable knowledge than that gleaned from a limited number of cases.

2. RATIONALE AND EVIDENCE THE PROJECT CAN BE SUCCESSFUL

The yield and quality of produce from farmers raising crops under similar conditions varies tremendously: this variation must be principally due to management. The variation in yield and quality is particularly large in the case of small farms with low input agriculture when farmers are not able to use costly amendments to provide uniform growing conditions over a wide area. Identification of those practices that produce good yields and quality for specific conditions could improve food availability and farm income.

Three brief examples show why we are so excited about the *Site Specific Agriculture based on Farmers' Experience (SSAFE)* approach. The examples indicate how the approach was first developed for a highly organized sub-sector, and then has been successfully adapted and adopted by small farmers first in the highly organized coffee sector and later in the traditionally less well organized tropical fruit sub-sector. Small scale producers with lower levels of formal social organization can use the SSAFE approach due to two principle factors: firstly they avidly accept the idea of sharing their own experiences as a guide to innovation and secondly modern information technology makes it possible to characterize growing conditions and handle the large data sets required to make sense of crop response to variation in management practices and natural conditions.

Sugarcane. For over 10 years the Colombian Sugarcane Research Centre (Cenicaña) compile data on more than 15,000 cane lots harvested each year and characterize them. The data is processed to make it comprehensible to the farmers who can access it on line and currently use it to decide on the best management for their specific conditions. Colombia now leads the world in sugar produced per ha per year: previous leaders, who use a traditional research approach, face stagnant productivity or even worse the syndrome of yield decline.

Coffee. In 2005 small scale coffee growers provided information on management practices and samples of coffee for cupping from geo-referenced "management units". Information from publicly available databases was used to describe climate and terrain. The two sets of information were combined and are available on line so that users can identify sites suitable for production of high quality coffee with apt management.

Tropical fruits. Guanábana (sour sop) producers normally have no idea what variety to plant under their particular conditions, which considering the length of the investment is a risky business. Farmers identified the best trees on a series of farms which were characterized in terms of climate and soils, and software linked to available data bases determines which of the selected varieties is appropriate for any particular geo-

referenced site. Using classical research approaches this process would have taken decades, whereas with the SSAFE approach it took three years.

3. Expected benefits of the project including comments on sustainability and scale

Farmers tend to believe in results which they know come from real experiences of their peers as opposed to those from well manicured plots on experimental stations far removed from their world. The project will provide farmers with improved management practices apt for their particular social and environmental circumstances. The beauty of the SSAFE approach is that practices can readily be transferred from one site or region to another: the detailed characterization of sites and the access to data bases that can identify other similar sites means that experiences with practices and crop response can be shared by farmers from sites with similar or homologous social and environmental conditions even when they are geographically distant.

The project will work largely through existing organizations including farmers groups which are a central feature of the approach of sharing of experiences. This contrasts strongly with the traditional linear model of agricultural research, and empowers farmers to make their own decisions, not only with respect to managing their crops but also in their relations with other actors in the product supply chain. In the particular case of specialty products farmers rather than being at the mercy of the specific characteristics of a site can exploit natural variability to differentiate their product and obtain added value.

The improved management practices and empowerment of farmers groups will lead to greater productivity and higher quality produce, which will in turn increase food availability and rural incomes. The number of farmers who benefit will be determined by the products to which local agencies choose to apply the SSAFE approach. It is expected that as farmer groups see the value of the SSAFE approach they will be prepared to pay directly a small fee for the services. In addition, as the SSAFE approach becomes more widespread suppliers of agricultural inputs will likely use it for publicity thus providing income to support the system.

4. How the project will target the needs and be of specific benefit to women smallholders

The project is based on the sharing of data and knowledge by multiple entities including, and of paramount importance, the farmers. To the extent that women smallholders are farming they will be direct beneficiaries of the project: as women in general communicate more freely and share more readily than men it is likely that they will be primary providers of information and thus also be the principle beneficiaries.

5. Project development

The development of a SSAFE programme comprises four key components in a continuous feedback cycle: (i) farmer group interpretation of shared information for decision making (ii) information capture on the production process by farmers themselves (iii) compiling of data (iv) processing of the data to make it comprehensible and (v) sharing of information with the farmers groups and the cycle once again continues. The project will plug into existing priority crops selected by farmers and local agencies taking into account their potential for development and the particular traits of the products.

The non-crop or product specific databases that characterize sites in time and space according to climate, weather, soils, infra-structure and socio-economic factors will be established by the project and made available to the particular product groups that are selected. The project will be executed by a consortium to be established specifically for this project that will include members with specific expertise and a successful track record in their particular fields with emphasis on developing capacity of local agencies.

5. PROJECTED COSTS OF THE PROJECT

The projected project costs are US$5 million per year for five years. Of this US$3 million per year will be (i) for local agencies and farmers to develop on farm data capture systems and systems for farmer groups to access the processed information and share the multiple experiences of many of their colleagues and (ii) to train farmers and other local agencies in their use. It is expected that much of the training will be by farmers themselves. Furthermore part of the sharing of knowledge will include visits by farmers to homologous sites which may be geographically distant.

The establishment of the databases, capture of data from other sources (eg: satellite imagery, TRMM, WorldClim), processing of data, establishment of on-line or other systems of access and overall coordination of the project will have an annual cost of US$2 million.

6. MEASURES OF SUCCESS

Success will be measured by increased incomes and improved welfare of those farmers that adopt and become an integral part of the SSAFE approach.

7. RISKS

We are well aware that the approach we are proposing is not a panacea: classical research and participatory research are still required and complement the SSAFE approach. The greatest risk we see is the latent period that exists between farmers deciding to get together to adopt the approach and getting sufficient processed data back in the hands of the farmers: farmer interest has to be maintained in this period. A further risk is the development of payment mechanisms (either directly for services or through publicity) to maintain the data bases, processing capacity and information access systems. Finally we have seen that the approach is often opposed, condemned and rejected by classical researchers for lack of scientific rigour.